



# Test Report: GSC40E-1050

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40W Single Output LED Power Supply

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RIPPLE & NOISE(Max)	V1: 3.8Vp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1:2.92 Vp-p
2	CURRENT ACCURACY	±8%	I/P: 230 VAC I/P:115VAC O/P:FULL LOAD Ta:25°C	1.030 A /230VAC@CV MAX-1V 1.066A /230VAC@CV MIN 0.998 A/115VAC@CV MAX-1V 1.024A/115VAC@CV MIN
3	SET UP TIME	230VAC/ 500 ms (Max) 115VAC/ 1000ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/134ms 115 VAC/229ms
4	OVER/UNDERSHOOT TEST	< ±15%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: <2.11 %
5	NO LOAD OUTPUT VOLTAGE (max.)	55V	I/P: 230 VAC O/P:NO LOAD Ta:25°C	44.86V

### INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~277 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	51.5V~277 V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE=300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN ( POWER ON/OFF NO DAMAGE ) (2) I/P:230Vac ON: 0.5 Sec . OFF: 0.5 Sec 20MIN	(1).TEST: OK (2).TEST : OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 90 VAC ~277VAC O/P:FULL~MIN LOAD Ta:25°C	OK
3	POWER FACTOR(TYP)	0.92/230 VAC FULL LOAD 0.98/115 VAC FULL LOAD 0.91/277 VAC FULL LOAD	I/P: 230 VAC/115VAC/277VAC O/P:FULL LOAD Ta:25°C	PF=0.9647/ 230V/100%LOAD PF=0.9879 / 115V/100%LOAD PF=0.9284/ 277V/100%LOAD
4	EFFICIENCY (TYP)	87.5 %	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	88.88 %
5	INPUT CURRENT (TYP)	277VAC/ 0.25A 230 VAC/ 0.35A 115 VAC/ 0.7 A	I/P: 277VAC/230 VAC/115 VAC O/P:FULL LOAD Ta:25°C	I=0.170mA / 277VAC I =0.1935mA/ 230VAC I =0.3644mA/ 115VAC
6	INRUSH CURRENT (TYP)	230 V/ 17 A COLD START  (twidh=110us measured at 50% Ipeak) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 9.2 A/ 230VAC  T50= 37.6 us

7	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 75% or higher	I/P : 230VAC I/P : 277VAC I/P : 115VAC O/P : 75% LOAD Ta : 25°C	THD: 16.035 % THD: 17.668 % THD: 12.608 %
8	NO LOAD POWER CONSUMPTION	< 0.15 W	I/P : 240VAC O/P : NO LOAD Ta : 25°C	< 0.0907 W

## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 277VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE Hiccup Mode

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 6A/650V	I/P:High-Line +3V =280V O/P: (1)Full Load input on/off (2)Output Short Ta:25°C	Q1 VDS (1)624V (2)504V
2	Diode Peak Voltage	D100 Rated 20A/300V	I/P:High-Line +3V = 280 V O/P: (1)Full Load input on/off (2)Output Short (3)NO LOAD Ta:25°C	(1)168V (2)134V (3)171V
3	Control IC Voltage Test	U 1 Rated 9V~30V	I/P:High-Line +3V =280 V O/P:(1) FULL LOAD (2)SHORT (3)NO LOAD (4)NO LOAD(LOW LINE) Ta:25°C	(1)24.6V (2)16.3V (3)26.3V (4)26.4V

## SAFETY & EMC TEST

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	IEC60950-1 I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.125 KVAC/min Ta:25°C	I/P-O/P:1.488mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25°C	I/P-O/P: >30GΩ NO DAMAGE
3	LEAKAGE CURRENT	IEC60950-1 < 0.5mA / 240VAC	I/P: 240 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.002 mA N-FG: 0.002 mA

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A CLASS C	I/P: 230VAC/50HZ O/P:100%/50% LED LOAD I/P :277VAC 60HZ O/P:100/75% LED LOAD Ta:25℃	PASS
2	CONDUCTION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																				
1	TEMPERATURE RISE TEST	MODEL : GSC40E-1400 1. ROOM AMBIENT BURN-IN : 2.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 29 °C 2. HIGH AMBIENT BURN-IN : 1.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 47.8 °C																																						
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=29℃</th> <th>HIGH AMBIENT Ta=47.8℃</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Q1</td> <td>77.4℃</td> <td>92.3℃</td> </tr> <tr> <td>2</td> <td>T1</td> <td>82.0℃</td> <td>96.2℃</td> </tr> <tr> <td>3</td> <td>C101</td> <td>65.2℃</td> <td>80.4℃</td> </tr> <tr> <td>4</td> <td>D100</td> <td>68.0℃</td> <td>83.2℃</td> </tr> <tr> <td>5</td> <td>L2</td> <td>69.3℃</td> <td>84.1℃</td> </tr> <tr> <td>6</td> <td>D3</td> <td>69.1℃</td> <td>84.3℃</td> </tr> <tr> <td>7</td> <td>C40</td> <td>68.1℃</td> <td>83.3℃</td> </tr> <tr> <td>8</td> <td>U1</td> <td>67.3℃</td> <td>81.9℃</td> </tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=29℃	HIGH AMBIENT Ta=47.8℃	1	Q1	77.4℃	92.3℃	2	T1	82.0℃	96.2℃	3	C101	65.2℃	80.4℃	4	D100	68.0℃	83.2℃	5	L2	69.3℃	84.1℃	6	D3	69.1℃	84.3℃	7	C40	68.1℃	83.3℃	8	U1	67.3℃	81.9℃
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230VAC/90VAC O/P : 100 % LOAD Ta= -35 °C	TEST : OK																																				



# 40W Single Output LED Power Supply

# GSC40E series

3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 305 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK
4	TEMPERATURE COEFFICIENT	±0.03%/°C(0-50°C)	I/P : 230 VAC O/P : FULL LOAD	±0.00153 %/°C(0-50°C)
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK
6	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35°C~ +55°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 72min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK
8	CAPACITOR LIFE CYCLE	SUPPOSE C101 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME		(1) 175883 HRS (2) 36486 HRS (3) 49839 HRS (4) 73908 HRS
9	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE : 358.9 KHRS		
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Tcase 75°C ; 50,000 hours @ Tcase70°C		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT ZENG

12.10.30 A50-F031